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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
: Examiner: M. Mayes  
KENJI SUZUKI, ET AL. )  
: Group Art Unit: 1734  
Application No.: 09/365,510 )  
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Filed: August 2, 1999 )  
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For: PROCESS AND APPARATUS FOR )  
FORMING IMAGES : May 3, 2004

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

REQUEST FOR RECONSIDERATION

Sir:

In response to the Official Action mailed February 3, 2004, Applicants respectfully request reconsideration and allowance in view of the following remarks.

Claims 1-8 and 10-16 remain pending in the application, with Claims 1, 6 and 10 being independent.

Claims 1, 4 and 10-12 were rejected under 35 U.S.C. § 103 as being unpatentable over Japanese Laid-Open Patent Application No. 59-91079 (Togano et al.) in view of U.S. Patent No. 5,521,002 (Sneed) and either U.S. Patent No. 5,891,824 (Simpson et al.) or U.S. Patent No. 4,756,963 (Yamamoto et al.). Claims 1-4 and 10-12 were rejected under § 103 in further view of Japanese Laid-Open Patent Application No.

10-44605 (Nakanishi). Claim 5 was rejected under § 103 in further view of U.S. Patent No. 4,864,324 (Shirota et al.). Claims 13-16 were rejected under § 103 in further view of U.S. Patent No. 4,978,560 (Stone). Claims 6-8 were rejected under § 103 over Togano et al. in view of Simpson et al. or Yamamoto et al. and in further view of Nakanishi and Stone. These rejections are respectfully traversed.

As is recited in independent Claim 1, the present invention relates to a process for forming images including the steps of conducting recording on a recording medium provided with an image-receiving layer, the image-receiving layer containing inorganic particles having a diameter of 0.1 to 10  $\mu\text{m}$  for imparting a matted appearance to the surface of the image-receiving layer, laminating a laminating film having a thickness of 2 to 40  $\mu\text{m}$  and comprising only a thermoplastic film without a backing layer onto the image-receiving layer, and plasticizing and smoothing the surface of the thermoplastic film that is opposite to the surface in contact with the image-receiving layer with heating and pressurizing means to bond a back side of the thermoplastic film onto the image-receiving layer.

As is recited in independent Claim 6, the present invention relates to an apparatus for forming images. The apparatus includes an ink-jet head, a laminate section and heating and pressurizing means. The ink-jet head records on a recording medium. The laminate section laminates a laminating film having a thickness of 2 to 40  $\mu\text{m}$  and comprised of only a thermoplastic film without a backing layer onto the recording medium on which recording has been conducted. The heating and pressurizing means plasticizes and smooths the thermoplastic film by heating and pressurizing and bonding a back side of

the thermoplastic film onto an image-receiving layer of the recording medium. The surface roughness (Ra) of the surface of said heating and pressurizing means that comes into contact with the thermoplastic film is 3 $\mu$ m or less.

As is recited in independent Claim 10, the present invention relates to a process for forming images including the steps of conducting recording on a recording medium provided with an image-receiving layer, laminating a laminating film having a thickness of 2 to 40  $\mu$ m and comprising only a thermoplastic film onto the image-receiving layer, and plasticizing and smoothing the surface of the laminating film that is opposite to the surface which is in contact with the image-receiving layer with heating and pressurizing means to bond a back side of the thermoplastic film onto the image-receiving layer.

As discussed previously, with the above arrangement and methods, glossiness can be imparted to recorded images formed by conducting recording on a recording medium that has fast ink absorbency and good coloring stability. A recording medium that contains particles having a diameter of 0.1 to 10  $\mu$ m has good ink absorbency and coloring stability. However, the particles can lead the surfaces thereof to become matted. In order to obtain glossy surfaces, after the images are formed on the recording medium, a thermoplastic film having a thickness of 2 to 40  $\mu$ m can be placed opposing a surface of the recording medium, and then the surface of the thermoplastic film can be smoothed by heating and pressurizing means from the backside. By using a thermoplastic film having a thickness of 2 to 40  $\mu$ m, the film surface can be smoothed without the unevenness of the recording medium appearing on the surface of the thermoplastic film.

In the recorder of Togano et al., recording paper 2 is recorded by recording heads 12 and then fed to a roller pair 27 where a laminate material 22 is also fed. The paper 2 and laminate material 22 are nipped by the roller pair 27 when their leading ends are aligned and are fed toward a pressure roller pair 28, where they are nipped and heated such that the laminate material is applied onto the surface of the paper by melting in order to protect the recorded image.

However, Applicants submit that Togano et al. does not disclose or suggest at least that the laminating film has a thickness of 2 to 40  $\mu\text{m}$ , as is recited in independent Claims 1, 6 and 10. Accordingly, there is no suggestion that Togano et al. can prevent the unevenness of the recording medium from appearing on the surface of the laminated film.

Togano et al. fails to disclose or suggest important features of the present invention recited in independent Claims 1, 6 and 10.

Sneed describes a matte type ink jet film using fillers to provide surface texture. The fillers should have a particle size of 0.1 to 25  $\mu\text{m}$ . However, Sneed is not believed to remedy the deficiencies of Togano et al. noted above with respect to the independent claims.

Yamamoto et al. relates to a protective member for laminating a print formed by recording an image on paper. The thickness of the protective transfer layer should be in a range of 1 to 100  $\mu\text{m}$ , and most preferably 5 to 50  $\mu\text{m}$ . However, Yamamoto et al. is of the type in which the transfer layer is supported by a substrate 2 such that it may be peeled from the substrate after being laminated over the recorded image

surface. This type of lamination is described in the Background section of Applicants' specification with regard to Figs. 3A-3C, and suffers from the drawbacks discussed therein.

It is respectfully submitted that one of ordinary skill in the art would not look to Yamamoto et al. to modify the recorder of Togano et al., in which a transparent resin film without a base material is used. Thus, the combination of Yamamoto et al. and Togano et al. is not well-founded.

Simpson et al. describes a transparent protective sheet for a thermal dye transfer print. Applicants submit that Simpson et al. describes a technique for adhering a transparent protective sheet to a receiving element, such as a thermal dye transfer image. The transparent protective sheet comprises a polyester sheet containing an ultraviolet absorbing agent. However, since Simpson et al. laminates heat-transfer image-receiving paper, and such media naturally have smooth surfaces, imparting glossiness is not an object of Simpson et al. Accordingly, one of ordinary skill in the art would not be motivated to plasticize and smooth the protective sheet of Simpson et al. Thus, one of ordinary skill in the art would not combine Simpson et al. with the teachings of Togano et al.

Nakanishi relates to a gloss imparting treatment for thermal recording paper. As discussed previously, when recording a cyan image, in particular, on a thermal recording paper comprising a thermal cyan color developing layer, a thermal magenta color developing layer, a thermal yellow color developing layer and a protective layer laminated on a support in the listed order, the energy required for recording is remarkably large due to the low thermal sensitivity of the thermal cyan color developing layer, so that the thermal head reaches a high temperature. As a result, the outermost protective layer, which comes

into contact with the thermal head, is softened and unevenness is caused on the surface due to being scratched by the thermal head. This problem is solved by bringing a surface of the thermal recording paper after recording into contact with a mirror-like surface and conducting heating and pressing treatment. However, Nakanishi is also not believed to remedy the deficiencies of the citations noted above with respect to independent Claims 1, 6 and 10.

Shirota et al. relates to a color image forming method and its ink and discloses a laminate film composed of a plurality of layers. However, Shirota et al. is also not believed to disclose or suggest those features noted above as lacking in the previous citations.

Stone relates to a method using a hot roll glosser for transparentizing resin-coated microencapsulated media. A roll of the glosser that comes into contact with the resin surface is formed with an ultra-smooth silicone surface. Applicants submit that Stone can impart glossiness to image-receiving paper. In the disclosed technique, particulate polymer materials are required to be fused, so that it is difficult to completely turn the polymeric materials into a coating film, resulting in insufficient glossiness. Stone is not believed to remedy the deficiencies of the citations noted above with respect to the independent claims.

Thus, independent Claims 1, 6 and 10 are patentable over the citations of record. Reconsideration and withdrawal of the § 103 rejections are respectfully requested.

For the foregoing reasons, Applicants respectfully submit that the present invention is patentably defined by independent Claims 1, 6 and 10. Dependent Claims 2-5,

7, 8 and 11-16 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of the dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the objection and rejections set forth in the above-noted Office Action, and an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark A. Wollan", written over a horizontal line.

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